

PROSPECTUS
2018

Transformative

EDUCATION



NUS
National University
of Singapore

Faculty of
Science

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NUS FACULTY OF SCIENCE

AN OVERVIEW

Distinguished Record

NUS is one of the prime movers in shaping Singapore's scientific landscape in education and research.

- More than 85 years of experience in providing quality science education
- One of the largest faculties in NUS with six departments: Biological Sciences, Chemistry, Mathematics, Pharmacy, Physics, and Statistics and Applied Probability
- One of the best universities in the world for science education
- Ranked by Quacquarelli Symonds [QS] as the top university in Asia for many science subjects in 2015, 2016 and 2017

Global Outlook

Study abroad programmes open the door to a global learning experience, broadening students' intellectual and global outlook.

- Over 70% of NUS Science students participate in study abroad programmes
- Collaborations with over 300 partner universities expose students to different cultures and academic environments

Holistic Learning

Students will experience an enriching educational journey, both in and outside the classroom.

- Home to more than 5,000 undergraduates and 1,300 postgraduate students
- Opportunities to engage award-winning professors in cutting-edge research
- Vibrant campus and student life

Diverse Learning Choices

Students have the flexibility to plan their learning pathways based on their interests and career aspirations.

- 25 primary majors, seven second majors, 15 minors, several concurrent degree programmes as well as double majors, double degrees, joint degrees, multidisciplinary and cross-faculty programmes
- Enhancement programmes to broaden students' academic horizons, like undergraduate research programmes, local and overseas internships, and inter- and multidisciplinary boutique programmes in Mathematics and Science

Bright Career Prospects

Our graduates are employed in various high-growth and high-impact industries.

- Career opportunities for graduates in key industries that drive Singapore's economic growth, such as biomedical sciences, consumer businesses, data analytics, education, financial services, healthcare, infocommunication technologies, safety and security, research and development, and urban solutions and sustainability
- Training in specialised domain knowledge and life skills such as critical thinking, problem-solving and interpersonal skills, which enhance employability and career mobility

TRANSFORMATIVE SCIENCE EDUCATION

Staying Ahead of the

 CH

 EMB

NUS Science
and core skills
innovation

Our rigorous
skills and training
to adapt to



Lead the Future

EMPOWER YOUR LEARNING
CHART YOUR PATHWAYS
Pursue LIFELONG LEARNING

Our graduates will gain fundamental science knowledge and skills that allow them to play a part in spurring growth and innovation in various industries, and improving lives.

Our broad-based curriculum equips you with valuable skills and the passion for lifelong learning. This enables our alumni to thrive in an uncertain future.

GEOPOLITICAL THREATS

CHANGING ECONOMY

FOURTH
INDUSTRIAL
REVOLUTION

DISRUPTIVE TECHNOLOGY



NEW! ACADEMIC PROGRAMMES

The Faculty of Science continues to increase our suite of academic programmes to provide students with the breadth and depth of educational training to face an increasingly complex future and to be prepared for careers in today's globalised workplace.

B.Sc. (Hons) in Pharmaceutical Science

The new B.Sc. (Hons) in Pharmaceutical Science programme will be offered from Academic Year 2018/2019. It equips students with a deep understanding of the drug discovery and development process, complemented with strong foundational knowledge of the regulatory and commercial environment.

Joint Degree Programme with University of Dundee

The new four-year Joint Degree Programme combining NUS' B.Sc. (Hons) in Life Sciences and University of Dundee (UoD)'s B.Sc. (Hons) in Biological Sciences / Biomedical Sciences will equip NUS Life Sciences students with drug discovery and design expertise. The first batch of students will be admitted in Academic Year 2018/2019.

The first of its kind joint Honours programme enables NUS Life Sciences students to complete a full-year research project at UoD. Students will also gain hands-on training in drug optimisation and design, by leveraging UoD's partnerships with leading pharmaceutical and biotechnology companies in the fight against diseases.

Concurrent Degree Programme with University of Melbourne Doctor of Veterinary Medicine

From Academic Year 2018/2019, students can opt for a new Concurrent Degree Programme (CDP) combining NUS' B.Sc. in Life Sciences and the Doctor of Veterinary Medicine offered by the Faculty of Veterinary and Agricultural Sciences, University of Melbourne. The CDP integrates the two degree programmes so that it is possible to accelerate and complete the programme in 5.5 years.

Students will acquire specialised theoretical, practical and clinical training in veterinary medicine, which deals with the prevention, diagnosis and treatment of disease in animals, as well as veterinary science, which deals with the health and well-being of animals.

RESEARCH OPPORTUNITIES FOR STUDENTS

Overview

The Faculty of Science is home to different clusters of research excellence, both in fundamental research to create knowledge, and applied research to spur innovation.

Apart from the final year project which you are required to, or may undertake during your Honours year, we have various research programmes which offer you opportunities to pursue independent research projects.

Through these programmes, you will develop valuable research skills, cultivate critical thinking and problem-solving skills, as well as sharpen communication and presentation skills. Some of these programmes are:

- **Undergraduate Research Opportunities Programme in Science (UROPS):** Year 2 or Year 3 undergraduate students can experience scientific research and discovery by participating in research projects (see page 16).
- **Special Programme in Science (SPS):** Students can undertake an integrative research project in a team on areas of contemporary science to understand an interdisciplinary approach to science (see page 15).
- **Overseas Summer Research Programme:** Students go abroad to conduct research in the laboratories of partner universities during the NUS vacation period (see page 17).

Research Institutes and Centres

You may also have opportunities to participate in the research work of some of the research institutes and centres in NUS. These include:

- Centre for Advanced 2D Materials
- Centre for Bioluminescence Sciences
- Centre for Ion Beam Applications
- Centre for Quantitative Finance
- Centre for Quantum Technologies
- Centre for Wavelets, Approximation and Information Processing
- Chemical, Molecular and Materials Analysis Centre
- Institute of Data Science
- Institute for Mathematical Sciences
- Life Sciences Institute
- Mechanobiology Institute
- NUS Environmental Research Institute
- NUS Nanoscience and Nanotechnology Institute
- Protein and Proteomics Centre
- Risk Management Institute
- Singapore Centre on Environmental Life Sciences Engineering
- Singapore Synchrotron Light Source
- Solar Energy Research Institute of Singapore
- Tropical Marine Science Institute

Research Areas within Faculty of Science

BIOLOGICAL SCIENCES

- **Molecular Cell & Developmental Biology:** Cell Signalling, Organelles & Cell Biology; Fish Developmental Biology & Disease Modelling; Host Pathogen Interactions & Immunology; Plant Molecular & Developmental Biology; Stem Cell & Cancer Biology
- **Biophysical Sciences:** Bioimaging Sciences; Computational Biology; Mechanobiology; Protein Science & Proteomics; Structural Biology
- **Ecology, Evolution & Biodiversity:** Animal Behaviour; Community Ecology; Conservation Biology; Darwin & Wallace; Environmental Biology; Systematics, Phylogeny & Biogeography Systematics

CHEMISTRY

- **Advanced Materials:** 2D Materials; Energy Materials; Graphene & Nanocarbons; Luminescent Biomarkers; Nanomaterials; Organic Optoelectronic Materials
- **Organic Chemistry:** Asymmetric Synthesis; Organic Catalysis; Transition Metal Catalysis
- **Chemical Biology & Medicinal Chemistry:** Development of Therapeutic Agents; Synthesis of Bioactive Molecules; Synthetic Biology
- **Computational Chemistry & Simulation:** Molecular Dynamics; Nanoscale Modelling
- **Environmental Chemistry:** Carbon Dioxide Fixation; Green Chemistry; Sensors; Water Eco-Efficiency

FOOD SCIENCE AND TECHNOLOGY PROGRAMME

Food Microbiology & Safety; Food Processing & Engineering; Human Nutrition; Food Chemistry & Analysis; Functional Food; Food Fermentation; Flavour & Sensory Science

LEE KONG CHIAN NATURAL HISTORY MUSEUM

- **Biodiversity Research:** Species Discovery with Next-Generation Sequencing; Environmental DNA; Taxonomy; Systematics; Conservation of Southeast Asia's Fauna

MATHEMATICS

- **Pure Mathematics:** Algebra & Number Theory; Combinatorics & Graph Theory; Dynamical Systems; Geometry & Topology; Mathematical Logic & Theoretical Computer Science; Partial Differential Equations & Geometric Analysis; Probability; Real, Functional & Harmonic Analysis; Representation Theory & Automorphic Forms
- **Applied & Computational Mathematics:** Computational Biology & Bioinformatics; Data Science; Imaging & Vision Science; Mathematical Finance & Mathematical Economics; Numerical Analysis & Scientific Computing; Optimisation

PHARMACY

- **Drug Discovery & Design:** Computational Modelling & Informatics; Natural Products & Traditional Chinese Medicine; Rational Drug Discovery

- **Health Services Research:** Clinical Pharmacy & Pharmacy Practice; Disease Control & Management; Pharmacoeconomics
- **Pharmaceutical Biology & Drug Disposition:** Disease Etiology, Biomarkers & Targets; Pharmacokinetics & Pharmacodynamics
- **Pharmaceutical Technology & Innovative Therapeutics:** Formulation & Processing; Innovative Nano-Therapeutics; Smart Drug Delivery & Novel Biosystems

PHYSICS

- **Advanced Materials:** 2D Materials; Nanostructures & Energy; Organic Semiconductors; Oxides; Spectroscopies; Nonlinear Optics; Surface Science
- **Biological & Soft Matter Physics:** Biopolymers; Mechanics of Biomolecules; Single-molecule Manipulation & Imaging
- **Ion Beam Science & Technology:** Proton Beam Writing; Proton Microscopy; Radiobiology
- **Theoretical & Computational Physics:** Astrophysics & Cosmology; Condensed Matter Physics; Electromagnetics & Acoustics; Quantum Control; Nonlinear Dynamics & Complex Systems; String Theory
- **Quantum Information Technologies:** Cold Atoms & Molecules; Atom & Ion Trapping; Cryptography; Quantum Entanglement & Information Theory; Quantum Optics & Atom-Photon Interaction

STATISTICS AND APPLIED PROBABILITY

- **Applications:** Biostatistics; Computational Biology; Environmental Statistics; Financial Statistics; Infectious Disease Modelling; Networks; Neural Science; Statistical Genetics
- **Statistical Methodology & Probability Theory:** Bayesian Inference; Big Data; Computational Statistics; Deep Learning; Distributional Approximation; Empirical Likelihood; Functional Data Analysis; High-Dimensional Data Analysis; Longitudinal Data Analysis; Monte-Carlo Methods; Semi- and Non-Parametric Regression; Spatial Statistics & Sequential Analysis; Survival Analysis

For the latest research news, please visit
www.science.nus.edu.sg/research/research-news.

DEPARTMENT OF BIOLOGICAL SCIENCES

Undergraduate Programmes

B.SC. (HONS) AND B.SC. IN LIFE SCIENCES

NUS' Life Sciences Major is the undergraduate course in biological and biomedical sciences. It provides foundational knowledge vital to all areas of life sciences in the first year of study, and a selection of relevant advanced-level modules which paves the way to one of the three specialisations and the many diverse disciplines in life sciences.

Honours students can continue to take a broad coverage of life sciences or choose to pursue one of the three specialisations:

- **Biomedical Science:** This focuses on human health and diseases, and its goal of clinical solutions.
- **Molecular and Cell Biology:** This emphasises the fundamental physical, chemical and biological mechanisms of living organisms.
- **Environmental Biology:** This affirms the importance and relevance of biodiversity and ecology, and its applications towards evolutionary understanding and environmental conservation.

NEW! CONCURRENT DEGREE PROGRAMME (CDP) NUS B.SC. IN LIFE SCIENCES WITH THE UNIVERSITY OF MELBOURNE DOCTOR OF VETERINARY MEDICINE

This programme allows students to embark on graduate studies in veterinary medicine concurrently while on a study abroad programme.

The CDP integrates the two degree programmes so that it is possible to accelerate and complete the programme in 5.5 years.

NEW! JOINT DEGREE PROGRAMME (JDP) NUS B.SC. (HONS) IN LIFE SCIENCES WITH UNIVERSITY OF DUNDEE

This programme focuses on drug discovery and development, and includes the unique arrangement for the final Honours year and research project to be conducted in the partner university.

For information on Second Major and Minor courses offered by the department, please refer to the chapter on "Admission Information".

Graduate Programmes

M.SC. / PH.D. BY RESEARCH

Your research focus can be in Biophysical Sciences; Cell, Molecular and Developmental Biology; and Ecology and Evolutionary Biology.

For **Biophysical Sciences**, the research areas include: Bioimaging Sciences; Computational and Systems Biology; Mechanobiology; and Structural Biology.

For **Cell, Molecular and Developmental Biology**, the research areas include: Cell Signalling and Developmental Regulation; Plant Molecular and Development Biology; and Stem Cell Biology and Gene Regulation.

For **Ecology and Evolutionary Biology**, the research areas include: Biodiversity of the Region; Conservation; and Sustainable Utilisation.



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DEPARTMENT OF CHEMISTRY

Undergraduate Programmes

B.SC. (HONS) AND B.SC. IN CHEMISTRY

NUS' B.Sc. (Hons) in Chemistry programme is accredited by the Royal Society of Chemistry. In Years 1 and 2, you will focus on the fundamental principles of chemistry, divided into Inorganic, Organic and Physical Chemistry, with application of knowledge in practical sessions.

Honours students can either pursue a general Honours degree or one of these specialisations:

- **Materials Chemistry:** This covers the synthesis, characterisations and applications of polymers, inorganic and organic solids, and devices.
- **Medicinal Chemistry:** This covers the design and synthesis of compounds as potential drugs, the identification of their functional groups and interactions with targets, as well as the methods used to assay the compounds.
- **Environment and Energy:** This covers the techniques used for environmental sampling and analysis, the chemistry and physics of energy generation and conversion processes, and their impact on energy policies.

NEW! DOUBLE MAJOR IN CHEMISTRY AND FOOD SCIENCE

Jointly offered with the Food Science and Technology programme as a direct admissions course, you will gain understanding on important aspects of food beyond the physical and chemical properties of food.

For information on Second Major and Minor courses offered by the department, please refer to the chapter on "Admission Information".

Graduate Programmes

M.SC. / PH.D. BY RESEARCH

Possible research areas include: Analytical Sciences; Catalysis; Chemical Biology; Computation, Modelling and Spectroscopy; Food Science and Technology; Inorganic and Organic Chemistry; Materials Science; Medicinal Chemistry; and Surface Science.

M.SC. IN CHEMISTRY FOR ENERGY AND ENVIRONMENT BY COURSEWORK

You will acquire knowledge of the latest energy and environmental technologies and deep understanding of modern materials design, synthesis strategies, advanced characterisation and analytical techniques.

M.SC. IN CHEMISTRY BY COURSEWORK

This four-year degree programme provides a broad scientific foundation in chemistry for advanced positions in the chemical industries and advanced degree programmes such as the Ph.D. in Chemistry.

JOINT M.SC. IN INDUSTRIAL CHEMISTRY BY COURSEWORK

You will gain specialist knowledge in selected areas of technology in the pharmaceutical and chemical industries in this programme, jointly offered with the Technical University of Munich.



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FOOD SCIENCE AND TECHNOLOGY PROGRAMME

Undergraduate Programmes

B.SC. (HONS) AND B.SC. IN FOOD SCIENCE AND TECHNOLOGY

This is a boutique programme that covers the full educational spectrum in Food Science and Technology, with emphasis on four essential themes: Food Quality and Safety; New Food Product Innovation; Food Processing; and Nutrition.

It is the only International Union of Food Science and Technology (IUFoST) accredited degree in Singapore, certified by IUFoST for meeting international standards and guidelines.

You will gain comprehensive knowledge of the scientific principles behind food and the technological developments in food science.

All undergraduates are guaranteed entry into the Professional Placement Programme, which enables you to put learning into practice through workplace experience.

NEW! DOUBLE MAJOR IN CHEMISTRY AND FOOD SCIENCE

This is jointly offered with the primary Major in Chemistry as a direct admissions course. You will gain understanding on important aspects of food beyond the physical and chemical properties of food.

For information on Second Major and Minor courses offered by the programme, please refer to the chapter on "Admission Information".

Graduate Programmes

M.SC. IN FOOD SCIENCE AND HUMAN NUTRITION BY COURSEWORK

This covers advanced topics comprehensively including: Food Bioscience (Microbiology and Safety, Fermentation); Evidence-based Functional Foods; Human Nutrition; Modern Analytical Science; and Modern Food Processing Technology.

Provision is available for Graduate Diploma and Graduate Certificate.

M.SC. / PH.D. IN FOOD SCIENCE AND TECHNOLOGY BY RESEARCH

Possible research focus areas include: Food Biotechnology; Food Chemistry and Analysis; Food Microbiology and Safety; Food Processing and Engineering; and Human Nutrition.

You can conduct research alongside experts to solve emerging problems or global challenges on food, and consumer health and well-being, in the fast-growing global food industry.



Food Science and Technology Programme

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DEPARTMENT OF MATHEMATICS

Undergraduate Programmes

B.SC. (HONS) AND B.SC. IN MATHEMATICS

You will learn fundamental mathematical concepts in areas including: Algebra; Differential Equations; Geometry and Topology; Logic; Number Theory and Combinatorics; and Real and Complex Analysis, with a focus on mathematical foundations and fundamental techniques.

B.SC. (HONS) AND B.SC. IN APPLIED MATHEMATICS

You will study mathematical methods and problem-solving techniques that are applied in science, engineering and computer science.

Honours students can either pursue a general Honours degree or one of these specialisations:

- **Operations Research and Financial Mathematics:** This covers the application of analytical methods and mathematical models to solve problems in areas like industrial engineering, operations management and finance.
- **Mathematical Modelling and Data Analytics:** This covers the use of mathematical models and numerical analysis to manage and analyse massive datasets.

B.SC. (HONS) AND B.SC. IN QUANTITATIVE FINANCE

In this multidisciplinary course, you will learn about mathematical theory and applications, statistical tools, computing theory and techniques, financial theory and principles, and core financial products.

B.SC. (HONS) IN DATA SCIENCE AND ANALYTICS

This four-year direct Honours multidisciplinary programme is jointly offered by the Faculty of Science's Department of Statistics and Applied Probability, and Department of Mathematics, in conjunction with the Department of Computer Science in the School of Computing.

You will be equipped with the ability to develop novel analytical tools to address data-driven problems in businesses and new scientific applications.

NEW! SECOND MAJOR IN DATA ANALYTICS

You can pursue this programme to acquire knowledge in data analytics, enabling you to apply computing and statistical methods to analyse and model complex data in your respective domains.

For information on Second Major and Minor courses offered by the department, please refer to the chapter on "Admission Information".

SPECIAL PROGRAMME IN MATHEMATICS

This specially designed programme for selected students with a strong passion and aptitude for mathematical sciences comprises modules in foundational mathematics, preparing you for graduate programmes and careers in the mathematical sciences.

Graduate Programmes

M.SC. IN MATHEMATICS BY COURSEWORK

This programme for mathematics teachers and professionals enables them to upgrade their professional skills and qualifications through advanced training.

M.SC. IN QUANTITATIVE FINANCE BY COURSEWORK

This programme, jointly offered with the Department of Economics in the Faculty of Arts and Social Sciences and the Department of Statistics and Applied Probability, equips you with advanced knowledge in Quantitative Finance, and its use in the financial industry.

M.SC. / PH.D. BY RESEARCH

Possible research focus areas include: Pure, Applied and Financial Mathematics.



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DEPARTMENT OF PHARMACY

Undergraduate Programmes

NEW! B.SC. (HONS) IN PHARMACEUTICAL SCIENCE

This four-year landmark programme focuses on the pharmaceutical sciences, culminating in an understanding of drug discovery and development, as well as the regulatory and commercial environment in pharmaceutical industries.

B.SC. (HONS) AND B.SC. IN PHARMACY

Our flagship four-year professional programme grooms future healthcare professionals, and educates students in all aspects of medicine and its use in disease management.

This multidisciplinary programme provides foundational knowledge in basic pharmaceutical sciences, dovetailing towards patient and disease management, health promotion and professional pharmacy skills development.

It is the only degree in Singapore recognised for onward registration with the Singapore Pharmacy Council for licensed pharmacists.

For information on Minor courses offered by the department, please refer to the chapter on "Admission Information".

Graduate Programmes

M.SC. (PHARMACEUTICAL SCIENCES AND TECHNOLOGY) BY COURSEWORK

This is designed for prospective students who are already working in, or aspiring to enter the pharmaceutical industry.

You will acquire in-depth knowledge and practical skills for formulation and process manufacturing of chemical and biological drugs into a range of dosage forms, and gain understanding of the regulatory and quality compliance of pharmaceuticals in the process of drug development and manufacturing.

M.SC. / PH.D. BY RESEARCH

This programme is suitable for students with a good basic degree in science, engineering or health-related disciplines who wish to enhance competencies in conducting independent research in a specialised area relevant to pharmaceutical sciences, for a career in academia, research or management.

DOCTOR OF PHARMACY (PHARM.D.) BY COURSEWORK AND CLINICAL CLERKSHIP

This two-year full-time programme, comprising both didactic and clerkship components, is designed to equip pharmacists with additional clinical knowledge, as well as clinical skills and attitudes to deliver high quality and safe medication therapies to patients in collaboration with other health professionals.

It builds on the undergraduate programme foundations and focuses on pharmacotherapy topics in greater depth, broadening your clinical pharmacy knowledge and patient care skills.

This programme contributes to the development of Specialist Clinical Pharmacists in Singapore.



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DEPARTMENT OF PHYSICS

Undergraduate Programmes

B.SC. (HONS) AND B.SC. IN PHYSICS

You will learn about Electro-magnetism; Thermo- and Electrodynamics; Quantum Mechanics; Atomic and Nuclear Physics; Nanophysics; Relativity; and relevant mathematical methods.

Honours students can either pursue a general Honours degree or one of these specialisations:

- **Astrophysics:** This focuses on Celestial Physics and Cosmology and is suitable for students aspiring to be physics teachers in schools and junior colleges.
- **Nanophysics:** This focuses on the scientific principles and methods of how physics is applied to industrial problem-solving and technological development.

For information on Second Major and Minor courses offered by the department, please refer to the chapter on "Admission Information".

Graduate Programmes

M.SC. BY COURSEWORK

This programme leads to an M.Sc. degree in either Physics or Applied Physics, enabling educators and professionals to further upgrade their professional skills and qualifications.

Applied Physics focuses on advanced training, especially in areas such as Semiconductor Manufacturing, Photonics and Biophysics. It is suited for physics graduates and professionals who wish to upgrade their professional skills and qualifications, or to switch to the high technology industry.

M.SC. / PH.D. BY RESEARCH

Possible research areas include: Acoustics and Computer Simulations; Astrophysics; Atomic Physics; Condensed Matter Physics; High Energy Physics; Infrared Spectroscopy; Ionics; Ion-Beam Applications; Laser Optics; Materials Science; Optics; Solid-State X-Ray Fluorescence; Superconductors; and Surface Physics.



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DEPARTMENT OF STATISTICS AND APPLIED PROBABILITY

Undergraduate Programmes

B.SC. (HONS) AND B.SC. IN STATISTICS

You will learn about the scientific application of mathematical principles to the collection, analysis and presentation of data, to gain insights from data which enable sound conclusions.

Honours students can either pursue a general Honours degree or one of these specialisations:

- **Data Science:** You will learn computing concepts and skills, enabling you to manage the collection, storage and analysis of large amounts of data in virtually every field.
- **Finance and Business Statistics:** You will learn about the application of statistics to the areas of investment and financial analysis, insurance, marketing research and management.

B.SC. (HONS) IN DATA SCIENCE AND ANALYTICS

This four-year direct Honours multidisciplinary programme is jointly offered by the Faculty of Science's Department of Statistics and Applied Probability, and Department of Mathematics, in conjunction with the Department of Computer Science in the School of Computing.

You will be equipped with the ability to develop novel analytical tools to address data-driven problems in businesses and new scientific applications.

NEW! SECOND MAJOR IN DATA ANALYTICS

You can pursue this programme to acquire knowledge in data analytics, enabling you to apply computing and statistical methods to analyse and model complex data in your respective domains.

For information on Second Major and Minor courses offered by the department, please refer to the chapter on "Admission Information".

Graduate Programmes

M.SC. IN STATISTICS BY COURSEWORK

This is designed for students from statistics, mathematics or related fields.

You will acquire practical skills to solve real-world industry problems, and an excellent knowledge of statistical principles and methods required in the application of statistics.

M.SC. IN STATISTICS BY RESEARCH

You will acquire advanced knowledge of theoretical and applied statistics.

Possible research areas include: Biostatistics; Computational Statistics; Financial Statistics; High-Dimensional Data Analysis; and Probability Theory and Applications.

PH.D. IN STATISTICS BY RESEARCH

You will acquire skills to produce high quality statistical research, for careers in research and development, and academia.

Possible research areas include: Bayesian Inference; Biostatistics; Functional Data Analysis; High-Dimensional Data Analysis; and Probability Theory and Applications.



Department of Statistics and Applied Probability

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DATA SCIENCE AND ANALYTICS PROGRAMME

Undergraduate Programme

The **B.Sc. (Hons) in Data Science and Analytics** is a four-year direct Honours multidisciplinary programme jointly offered by the Faculty of Science's Department of Statistics and Applied Probability, and Department of Mathematics, in conjunction with the Department of Computer Science in the School of Computing.

You will be equipped with the ability to develop novel analytical tools to address data-driven problems in businesses and new scientific applications.

In this interdisciplinary programme, you will read modules in mathematics, statistics and computer science, and be exposed to the interplay among these three key areas in the practice of data science.

In Years 3 and 4, you will delve in-depth into analytics methods such as computation and optimisation; computer algorithms; database and data processing; data mining and machine learning; and high-dimensional statistics; as well as applications of analytics to various domains.

Programme highlights

- **Capstone module:** The industry-driven module enables you to work on research and projects that are related to real-life data and workplace challenges.
- **NUS Co-Operative Education Programme:** You may gain extensive workplace experience by spending 18 months (five consecutive semesters and terms) with reputable employers.

These programmes will enhance your employability upon graduation for careers in diverse industries and businesses that require insights from Big Data, enabling them to be smarter, more productive and more competitive.

NEW! SECOND MAJOR IN DATA ANALYTICS

You can pursue this programme to acquire knowledge in data analytics, enabling you to apply computing and statistical methods to analyse and model complex data in your respective domains.



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COMPUTATIONAL BIOLOGY PROGRAMME

The **B.Sc. (Hons) in Computational Biology** is a four-year multidisciplinary programme which provides interdisciplinary education in computer-based analysis of biological problems, the fastest growing area of the life sciences.

It is highly suited for students with keen interest in mathematics, computing and life sciences. It also provides excellent research opportunities and mentorship. Students are often mentored by two professors from different faculties.

In Years 1 and 2, you will learn about the foundations of university-level life sciences, mathematics and statistics, and computer science; how to develop, apply and interpret algorithms to biology; and how to reason analytically about biological problems.

In Years 3 and 4, you can focus on your interests, culminating with a two-semester final year research project.

Key specialisation topics

- Big Data analysis of next-generation DNA and RNA sequencing
- Biological and pharmaceutical databases
- Modelling of biological systems, including genes, pathways and ecological systems
 - Computational genomics
 - Computational neuroscience
 - Computer-aided drug design
- Theoretical foundations and analysis of genes / proteins

You will acquire broadly applicable skills in modern biological sciences, mathematical and statistical analysis, as well as computer science.



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(Undergraduate Programmes)

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ENVIRONMENTAL STUDIES PROGRAMME

The **Bachelor of Environmental Studies** is a four-year direct Honours degree programme, jointly hosted by the Faculty of Science and the Faculty of Arts and Social Sciences, with participation from the Faculty of Engineering, the Faculty of Law, School of Design and Environment, NUS Business School, Yong Loo Lin School of Medicine, Saw Swee Hock School of Public Health, and the Lee Kuan Yew School of Public Policy.

It adopts a unique interdisciplinary approach in addressing complex, modern environmental issues such as climate change, land use, water usage, alternative energy and the building of liveable high-density cities.

This multidisciplinary programme includes a two-year broad-based curriculum where you read core modules in biology, chemistry, economics, geography, law, management, mathematics, policy, public health and statistics.

Year 3 students have the option of specialising in either Environmental Biology or Environmental Geography:

Environmental Biology: This includes modules in Behavioural Biology; Biodiversity; Evolution; Field Studies; Freshwater and Terrestrial Ecology; Marine Biology; and Physiology.

Environmental Geography: This includes modules in Climate; Economics; Environmental Management; Geography; Geographical Information Systems; Geosciences; Modelling; and Sustainability.

Three capstone modules

- **ENV3101 and ENV3102: Environmental Challenges: Asian Case Studies:** These two modules are interconnected. The latter takes you on an extended field trip to one of the countries in the Asia region, where you can experience firsthand the issues you studied in ENV3101.
- **ENV4101: Environmental Management in Singapore:** This is a closed-door, town-hall style series where you can discuss a wide range of professional topics with experts in their respective fields. These roundtable discussions provide an unprecedented opportunity to learn about the real ins and outs of these fields.

Programme highlights

These include specially designed integrated modules which emphasise small-group discussions, case studies, fireside chats and guest lectures with key environmental luminaries, policy-makers and government officials.

You can participate in undergraduate research, as well as internships with environmental agencies, natural resource management agencies and environmental research centres / institutes.

You can also go on study abroad programmes, which provide you a global learning experience.

You can experience real-world and real-time field studies, to understand selected environmental challenges facing Asia.



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(Undergraduate Programmes)

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SPECIAL PROGRAMMES

In addition to the diversity of courses and the rigorous training provided by our basic degree programmes, the Faculty of Science also offers a host of special programmes to broaden students' intellectual and personal horizons.

Global Science Programme (GSP)

GSP trains outstanding scientists to support Singapore's strategic focus on developing research and development manpower for a knowledge-based economy. It is designed to attract the top 5% of each freshmen cohort enrolled in the Faculty of Science.

You will be groomed through a concurrent, through-train Integrated Science Curriculum in the Special Programme in Science, followed by a joint M.Sc. / Ph.D. graduate programme with one of the top world-class universities.

The programme typically comprises a four-year B.Sc. (Hons) degree and a one-year Masters degree by research at either NUS or an overseas partner university, followed by a three-year joint Ph.D. where half of the candidature will be spent at a selected prestigious partner university such as King's College London; Imperial College London; the Australian National University; École Polytechnique; the German Institute of Science and Technology; the Technical University of Munich; and many more.

Some programmes designed under the GSP are:

Four-Year Concurrent Degree Programme in NUS B.Sc. (Hons) in Life Sciences and King's College London (KCL) M.Res. in Molecular Biophysics

The programme nurtures talent for the increasingly important field of biophysics. You will learn from experts from the Randall Division of Cell and Molecular Biophysics in KCL, and the Mechanobiology Institute and Centre for Bioimaging Sciences in NUS. In the one-year M.Res. programme, you will focus on in-depth practical biophysics research and read courses in molecular biophysics and biology.

Five-Year Concurrent Degree Programme in NUS B.Sc. (Hons) in Life Sciences or Chemistry and King's College London M.Sc. in Forensic Science or Analytical Toxicology

The programme prepares you for careers in forensic science, and analytical and supervisory roles in government agencies and the private sector.

In the KCL M.Sc. in Forensic Science programme, you will learn from forensic practitioners and field experts, as well as undergo experiential learning onsite and in the laboratories of the Metropolitan Police Forensic Services Directorate.

In the KCL M.Sc. in Analytical Toxicology programme, you will learn about the integration of theories and practices in Analytical Science with Clinical and Forensic Toxicology.

Joint Ph.D. Programme with King's College London

The programme enhances research competencies in the important fields of biological, biomedical and biophysical sciences by nurturing highly competent Ph.D. holders to address complex interdisciplinary scientific problems. You will graduate with a joint qualification, earning a certificate that bears the crest of both NUS and KCL.

For more information on the GSP, please visit www.science.nus.edu.sg/undergraduate-studies/ugenh/gsp. You can also email your enquiries to askscience@nus.edu.sg.

NUS Pre-Medical Programme (PMP)

The programme prepares a select group of students for the unique opportunity of joining the Doctor of Medicine at Duke-NUS Medical School or graduate programmes in Biomedical Science, upon successful completion of their undergraduate degrees and the requirements of the Pre-Medical Programme.



SPECIAL PROGRAMMES

Years 1 and 2 undergraduate students from the Faculty of Science may apply to read GMS1000: The Duke-NUS Pre-Medical Module in or in the Special Term. Applicants will undergo a pre-selection process where you are assessed based on your academic potential, achievements and aptitude for a medicine course. Shortlisted students will take GMS1000, a semester-long module taught by Duke-NUS Medical School postdoctoral fellows. Throughout the course, your performance will be assessed and a few will be selected as NUS Pre-Med Scholars.

Scholars will participate in medical shadowing and research internships as well as regular seminars and talks.

For more information on the PMP, please visit www.science.nus.edu.sg/education/undergraduate/ug-programmes/pre-med. You can also email your enquiries to askscience@nus.edu.sg.

Special Programme in Science (SPS)

The programme prepares students with an aptitude for science to address modern multidisciplinary scientific challenges.

It fosters creative and critical thinking through scientific investigations and in-depth studies, as well as mentorship by senior SPS students, graduate students, instructors and professors.

The Integrated Science Curriculum comprises four specially-designed thematic modules that integrate Biology, Chemistry, Mathematics and Physics, and two research-oriented modules.

Admission is selective. Prospective students are interviewed to determine your passion in science and intellectual maturity.

For more information on SPS, please visit <http://sps.nus.edu.sg>. You can also email your enquiries to admin@sps.nus.edu.sg.

Internships

You will have multiple opportunities during your candidature to take up internships at renowned local and international organisations, through the Undergraduate Professional Internship Programme and Honours year Applied Project modules.

These programmes provide experiential learning on-the-job. This includes the following:

Learn to plan your academic and career development:

You will be able to test your interests and develop long-term career plans, which will also help you to select elective coursework that integrates your studies and career goals.

Acquire transferable skills: The work experience will develop your maturity by strengthening your resourcefulness, problem-solving skills, self-discipline, response-abilities and teamwork.

Translate scientific principles: Become adept in applying classroom learning to perform assignments and solve problems in a real-world professional environment.

Upon successful completion of the internship, you will also be awarded Unrestricted Modular Credits that count towards your graduation requirements.

For more information on UPIP, please visit www.science.nus.edu.sg/students/upip. You can also email your enquiries to sciupip@nus.edu.sg.



SPECIAL PROGRAMMES

Undergraduate Research Opportunities Programme in Science (UOPS)

The programme provides you a unique opportunity to work with our Faculty members and experience the challenges and benefits of undertaking an independent research project.

You will get to work at the frontiers of scientific research through close interaction with established scientists in their fields.

You will enhance your knowledge in the latest developments in science and technology, and acquire communication and presentation skills.

You can choose to take a UOPS project during regular semesters or special terms (May to July).

For more information on UOPS, please visit www.science.nus.edu.sg/undergraduate-studies/ugenh/uops-main. You can also email your enquiries to scienhance@nus.edu.sg.

University Scholars Programme (USP)

This multi- and interdisciplinary academic programme shapes independent, broad and adaptable thinkers and doers through its transformative learning environment, innovative curriculum and diverse global opportunities.

The programme admits students from seven faculties / schools - Arts and Social Sciences; Business; Computing; Design and Environment; Engineering; Science; and Law.

You will be challenged to build upon, or go beyond your majors, by thinking critically and approaching topics from different disciplinary perspectives. This enables you to make connections across disciplines and challenge conventional ways of thinking.

You will attend seminar-style classes, and do 30% of your academic work in USP and 70% in your home faculty / school where you read your majors.

You will flourish in different ways through an enriching residential experience in an organic, self-driven environment that encourages exchange, peer learning and collaboration. This is achieved by living at the USP residential college, Cinnamon College, at University Town, for at least two years.

You will organise or take part in USP International Programmes, which challenge you on issues outside your fields of interest and enhance your global perspectives.

USP admissions open every year with NUS' general admissions and selected applicants will be interviewed. A second USP admissions exercise is also considered for Faculty of Science freshmen in Semester 2 of study.

USP is not a scholarship disbursement programme. You may, however, apply for NUS scholarships or be recipients of other scholarships.

Upon successful completion of USP requirements and an Honours programme, you will graduate with an Honours degree from your faculty / school and receive a certificate of recognition as a University Scholar.

For more information on USP, please visit www.usp.nus.edu.sg. You can also email your enquiries to scienhance@nus.edu.sg.



STUDY ABROAD PROGRAMMES

Study abroad programmes with over 300 overseas partner universities open the door to a global learning experience. You will gain exposure to different cultures and academic environments. Ranging from three weeks to a full year, these programmes allow you to study abroad while paying only home university fees. All courses taken while on exchange will earn you modular credits towards fulfilling graduation requirements.

Student Exchange Programme

Students spend one semester or a year at an overseas partner university.

Going on exchange allows you to read modules not taught in NUS.

We have over 300 reputable partner universities, including University College Cork; Radboud University; University of Toronto; Colgate University; Cornell University; The University of North Carolina at Chapel Hill; La Trobe University; Chang Gung University; Victoria University of Wellington; The University of Adelaide; and many more.

Summer Programme

Spanning three to eight weeks, these programmes are ideal should you prefer to gain an overseas learning experience outside regular semesters.

Places offered in our partner universities are reserved for NUS Science students only.

Summer Programmes allow you to read NUS modules in an overseas setting.

Some participating overseas universities include University of Toronto; The University of North Carolina at Chapel Hill; University of California, Los Angeles; Radboud University; University of Copenhagen; and Hokkaido University.

Overseas Summer Research Programme

Students spend eight to 12 weeks in the laboratories of our partner universities and research institutes.

Students from all disciplines can enrol in these programmes.

Some partner universities and research institutes include University of Cambridge, St John's College; Imperial College London; King's College London; The University of North Carolina at Chapel Hill; University of Alberta; University of Toronto; University Autónoma de Madrid; King Abdullah University of Science and Technology; Shanghai Jiao Tong University; Chang Gung University; and Academia Sinica.

NUS Overseas Colleges (NOC) Programme

Selected students will spend 12 months with a high technology startup in Beijing, New York, Silicon Valley, Shanghai or Stockholm, or six to seven months in Beijing, Israel, Munich, Lausanne or NOC Singapore.

You will gain firsthand insights into the operations of high technology startups and experience the challenges faced by the founders of these companies.

You can enrol in entrepreneurship courses at highly reputable universities like Stanford University; Fudan University; Tsinghua University; Technical University of Munich; and the KTH Royal Institute of Technology

Double Degree Programme with the French Grandes Écoles

The Grandes Écoles are a cluster of world-renowned institutions of higher scientific learning with a history of over 200 years, known for educating France's technical and management elites.

NUS has set up Double Degree programmes with six premier French Grandes École:

- École Polytechnique (X)
- École Centrale Supélec (Supélec)
- École des Mines de Paris (Mines Paris Tech)
- École Nationale Supérieure des Télécommunications (Télécom ParisTech)
- École Nationale Supérieure de Techniques Avancées (ENSTA ParisTech)
- École des Ponts ParisTech (École Nationale des Ponts et Chaussées)



STUDY ABROAD PROGRAMMES

Students are selected in Year 1 among top engineering, science and computing applicants.

Grandes Écoles place strong emphasis on mathematics and physics curricula in Year 1.

You will undergo French language preparation, spend Year 3 and 4 in a French institution, and return to NUS for your M.Sc. programme.

Upon graduation, you will receive a B.Sc. (Hons) degree, an M.Sc. degree from NUS and a Diplôme d'Ingenieur (the equivalent of Masters in France) from a French Grande École.

Joint Degree Programme with Australian National University (ANU)

This four-year programme combines the Bachelor of Philosophy (Hons) degree of the ANU with NUS' B.Sc. (Hons) degree.

It is only offered to NUS Science students in the University Scholars Programme who are majoring in Chemistry, Mathematics and Physics, and is suitable if you have an interest and aptitude for graduate research work.

Up to six students are accepted into the programme annually.

You will spend three semesters at NUS, followed by three semesters at ANU, before returning to NUS to complete the Honours year.

You will acquire a strong foundation in critical analysis and in-depth perspectives into the principles of each subject, while actively undertaking independent undergraduate research work.

Applications open in October each year. Successful students are provisionally admitted to the programme based on academic performance and other relevant qualifications. Official admission into the programme will only take place at the end of Semester 3.

Joint Degree Programme in Life Sciences with The University of North Carolina at Chapel Hill (UNC-CH)

This four-year programme, offered in collaboration between the Faculty of Science and the College of Arts and Sciences, UNC-CH, leads to a B.Sc. (Hons) in Life Sciences from NUS and a B.Sc. in Biology from UNC-CH.

It offers students from both institutions a unique learning experience encompassing advanced life sciences modules, undergraduate research and exposure to UNC-CH's exceptional liberal arts education.

NUS students will generally spend Semesters 1 to 3 in NUS, Semesters 4 to 6 in UNC-CH and Semesters 7 to 8 in NUS.

Upon graduation, you will receive a degree jointly validated by NUS and UNC-CH.

Joint Minor Programme with University of Toronto (UofT)

This programme offers two joint minor programmes in either Environmental Biology or Environmental Chemistry with UofT.

You will study advanced courses for one semester at UofT, where you will benefit from their expertise in Environmental Sciences.

For more information on our study abroad programmes, please visit www.science.nus.edu.sg/education/undergraduate/ug-programmes/sap-outgoing. You can also email your enquiries to scisap@nus.edu.sg.

ADMISSION INFORMATION

AT A GLANCE



ADMISSION INFORMATION

AT A GLANCE

Admission Requirements for Students with GCE 'A' Level (H1/H2) Qualifications or Equivalent

For admission to the Faculty of Science, applicants must have good GCE 'A' Level (H2) passes or equivalent in at least two of these science subjects: Biology, Chemistry, Computing / Computer Science, Mathematics / Further Mathematics, Physics.

Students admitted to the Faculty of Science will choose their major in July if they meet the prerequisites for that major. Students intending to pursue major courses like Data Science and Analytics, Food Science and Technology, Environmental Studies, Pharmaceutical Science or Pharmacy, can opt for any of them via the online application form.

Primary Majors Leading to an Honours Degree	Prerequisites for Students Offering H2 Curriculum or Equivalent
• Chemistry • Chemistry Specialisation in Materials Chemistry • Chemistry Specialisation in Medicinal Chemistry • Chemistry Specialisation in Environment and Energy	Good H2 pass or equivalent in Chemistry and at least a good 'O' Level pass or equivalent in Mathematics
• Computational Biology**	Good H2 passes (or equivalent) in Mathematics / Further Mathematics and either Biology or Chemistry <i>Students without H2 passes (or equivalent) in either Biology or Chemistry should have at least an 'O'-Level (or equivalent) pass in it. Admission is subject to departmental approval.</i>
• Data Science and Analytics#	Very good pass in either H2 Mathematics / H2 Further Mathematics, and a good pass in H2 Biology or H2 Chemistry or H2 Physics or H2 Computing
• Food Science and Technology	Good H2 pass or equivalent in Chemistry, and a good H2 pass or equivalent in Biology or Mathematics / Further Mathematics or Physics or Computing / Computer Science, and a good pass in 'O'-Level or equivalent, or above in Biology <i>Students without H2 pass in Biology are required to read the bridging module in Biology (i.e. LSM1301) in Semester 1 to fulfil the prerequisite for the relevant Level 1000 Life Sciences module in the syllabus.</i>

Primary Majors Leading to an Honours Degree	Prerequisites for Students Offering H2 Curriculum or Equivalent
• Life Sciences • Life Sciences Specialisation in Biomedical Science Specialisation in Environmental Biology Specialisation in Molecular and Cell Biology	Two good H2 passes or equivalent in Biology or Chemistry, or Mathematics / Further Mathematics or Physics <i>Students without H2 pass in Biology or Chemistry may read the relevant bridging modules as entry requirements.</i>
• Mathematics • Applied Mathematics • Applied Mathematics Specialisation in Mathematical Modelling and Data Analytics Specialisation in Operations Research and Financial Mathematics • Quantitative Finance*	Good H2 pass or equivalent in Mathematics / Further Mathematics
• Pharmaceutical Science*	Very good pass in H2 Chemistry and a very good pass in either H2 Biology or H2 Physics or H2 Mathematics / Further Mathematics
• Pharmacy* (Professional programme where application is by direct admissions only)	Very good H2 passes or equivalent in Chemistry and either Biology, Mathematics / Further Mathematics or Physics
• Physics • Physics Specialisation in Astrophysics Specialisation in Nanophysics	Good H2 passes or equivalent in Physics and Mathematics / Further Mathematics
• Statistics • Statistics Specialisation in Data Science Specialisation in Finance and Business Statistics	Good H2 pass or equivalent in Mathematics / Further Mathematics
Interdisciplinary Degree Programme	Prerequisites for Students Offering H2 Curriculum or Equivalent
• Bachelor of Environmental Studies (Specialisation in Environmental Biology)*	Good H1 pass or equivalent in Mathematics and good H2 pass or equivalent in either Biology or Chemistry

NOTE

a) * Admission to the Faculty of Science does not automatically qualify a student to choose these majors as there will be additional departmental selection due to limited places.

b) # These are strict four-year programmes while students in other majors can graduate with a Bachelor of Science (B.Sc.) degree after three years.

c) Specialisations are awarded only with a B.Sc. (Hons) degree.

Courses Beyond Primary Major

The Faculty of Science offers a flexible curriculum, which allows students who wish to enrich and broaden their educational experiences to choose other courses and programmes beyond their primary major course. Students may do a double degree (two degrees with two full majors), a double major (one primary and one second major) and / or minor programmes within and outside the Faculty.

Within the Faculty of Science

Second Majors (Optional)	Prerequisites for Students Offering H2 Curriculum or Equivalent
• Chemistry	Good H2 pass or equivalent in Chemistry
• Data Analytics	Very good pass in H2 Mathematics / Further Mathematics
• Life Sciences	Two good H2 passes or equivalent in Biology or Chemistry or Mathematics / Further Mathematics or Physics
• Mathematics • Statistics	Good H2 pass or equivalent in Mathematics / Further Mathematics
• Physics	Good H2 pass or equivalent in Physics

Minors (Optional)	Prerequisites for Students Offering H2 Curriculum or Equivalent
• Analytical Chemistry	Good H2 pass or equivalent in Chemistry
• Biophysics	Good H2 passes or equivalent in Physics, Chemistry and / or Biology
• Forensic Science*	Good H2 passes or equivalent in Chemistry and Biology
• Life Sciences	Good H2 pass or equivalent in Biology
• Mathematics • Financial Mathematics • Statistics	Good H2 pass or equivalent in Mathematics / Further Mathematics
• Nanoscience	Good H2 pass or equivalent in Chemistry or Physics
• Pharmaceutical Sciences*	Good H2 pass or equivalent in Chemistry or Biology

Minors (Optional)	Prerequisites for Students Offering H2 Curriculum or Equivalent
• Physics • Optical and Semiconductor Technology	Good H2 pass or equivalent in Physics

NOTE

* Application is subject to departmental approval.

Joint Minors (Optional)	Prerequisites for Students Offering H2 Curriculum or Equivalent
• Aquatic Ecology*	Open to students from all disciplines, except those who are reading the Bachelor of Environmental Studies degree from Academic Year 2016/2017 cohort and onwards (an interview is required)
• Engineering Materials*	Good H2 pass or equivalent in Chemistry or Physics
• Environmental Biology*	Good H2 passes or equivalent in Biology and Mathematics / Further Mathematics
• Environmental Chemistry*	Good H2 passes or equivalent in Physics and Mathematics / Further Mathematics
• Medical Physics*	Open to students from Faculty of Science and Faculty of Engineering with good H2 passes or equivalent in Physics and Biology

NOTE

* Application is subject to departmental approval.

Students can apply directly to the following double major programme within the Faculty of Science (FoS) via the online admission application form.

FoS Major	2nd Major (From FoS)	Admission Requirements*
Chemistry	Food Science	Good H2 pass or equivalent in Chemistry, and a good H2 pass or equivalent in Biology or Mathematics / Further Mathematics or Physics or Computing / Computer Science, and a good pass in 'O'-Level or equivalent, or above in Biology

NOTE

* Applicants satisfying the admission requirements will be subject to selection criteria before being admitted into the programme.

Outside the Faculty of Science

Students can apply directly to the following double major programmes via the online admission application form.

FoS Major	2nd Major (From Other Faculties / Schools)	Admission Requirements*
Applied Mathematics	Economics (FASS)	Good H2 pass or equivalent in Mathematics / Further Mathematics
Mathematics	Economics (FASS)	Good H2 pass or equivalent in Mathematics / Further Mathematics
Statistics	Economics (FASS)	Good H2 pass or equivalent in Mathematics / Further Mathematics
Life Sciences	Psychology (FASS)	Two good H2 passes or equivalent in Biology or Chemistry or Mathematics / Further Mathematics or Physics
Applied Mathematics	Computer Science (SoC)	Good H2 pass or equivalent in Mathematics / Further Mathematics
Mathematics	Computer Science (SoC)	Good H2 pass or equivalent in Mathematics / Further Mathematics
Statistics	Computer Science (SoC)	Good H2 pass or equivalent in Mathematics / Further Mathematics
Applied Mathematics	Information Security (SoC)	Good H2 pass or equivalent in Mathematics / Further Mathematics
Mathematics	Information Security (SoC)	Good H2 pass or equivalent in Mathematics / Further Mathematics
Statistics	Information Security (SoC)	Good H2 pass or equivalent in Mathematics / Further Mathematics
Applied Mathematics	Business Analytics (SoC)	Good H2 pass or equivalent in Mathematics / Further Mathematics
Mathematics	Business Analytics (SoC)	Good H2 pass or equivalent in Mathematics / Further Mathematics
Statistics	Business Analytics (SoC)	Good H2 pass or equivalent in Mathematics / Further Mathematics
Applied Mathematics	Management (Biz)	Good H2 pass or equivalent in Mathematics / Further Mathematics
Mathematics	Management (Biz)	Good H2 pass or equivalent in Mathematics / Further Mathematics
Statistics	Management (Biz)	Good H2 pass or equivalent in Mathematics / Further Mathematics
Life Sciences	Management (Biz)	Two good H2 passes or equivalent in Biology or Chemistry or Mathematics / Further Mathematics or Physics

FoS Major	2nd Major (From Other Faculties / Schools)	Admission Requirements*
Chemistry	Food Science (FoS)	Two good H2 passes or equivalent in Biology or Chemistry or Mathematics / Further Mathematics or Physics

NOTE

* Applicants satisfying the admission requirements will be subject to selection criteria before being admitted into the programme.

Major with Minor Programmes

Students can apply directly to the following major with minor programmes via the online admission application form.

FoS Major	Minor (From Other Faculties / Schools)	Admission Requirements*
Applied Mathematics	Information Security (SoC)	Good H2 pass or equivalent in Mathematics / Further Mathematics
Computational Biology	Information Security (SoC)	Good H2 passes or equivalent in Mathematics / Further Mathematics and either Biology or Chemistry
Quantitative Finance	Information Security (SoC)	Good H2 pass or equivalent in Mathematics / Further Mathematics
Statistics	Information Security (SoC)	Good H2 pass or equivalent in Mathematics / Further Mathematics
Life Sciences	Public Health (SSHSPH)	Two good H2 passes or equivalent in Biology or Chemistry or Mathematics / Further Mathematics or Physics
Mathematics	Entrepreneurship (Biz)	Good H2 pass or equivalent in Mathematics / Further Mathematics
Applied Mathematics	Entrepreneurship (Biz)	Good H2 pass or equivalent in Mathematics / Further Mathematics
Statistics	Entrepreneurship (Biz)	Good H2 pass or equivalent in Mathematics / Further Mathematics
Data Science and Analytics	Entrepreneurship (Biz)	Very good H2 pass or equivalent in Mathematics / Further Mathematics and a good H2 pass or equivalent in Biology or Chemistry or Physics or Computing
Life Sciences	Entrepreneurship (Biz)	Two good H2 passes or equivalent in Biology or Chemistry or Mathematics / Further Mathematics or Physics
Food Science and Technology	Entrepreneurship (Biz)	Good H2 pass or equivalent in Chemistry and a good H2 pass or equivalent in Biology or Mathematics / Further Mathematics or Physics or Computing / Computer Science, and a good pass in 'O'-Level or equivalent, or above in Biology

NOTE

* Applicants satisfying the admission requirements will be subject to selection criteria before being admitted into the programme.

LEGEND

Biz: NUS Business School; FASS: Faculty of Arts and Social Sciences; FoS: Faculty of Science; SoC: School of Computing; SSHSPH: Saw Swee Hock School of Public Health

After admission to the Faculty of Science, students can also self-design their own major / second major or double degree combinations as shown below.

Examples of Possible Double Major Combinations

- Chemistry and Geography
- Chemistry and Management
- Chemistry and Political Science
- Life Sciences and English Language
- Life Sciences and Sociology
- Mathematics and Chinese Studies
- Quantitative Finance and Economics

For more information on such self-designed programmes, please visit the Registrar's Office website at: <http://nus.edu.sg/registrar/education-at-nus/undergraduate-education/special-undergraduate-programmes.html>. You can also email your enquiries to askscience@nus.edu.sg.

Examples of Possible Double Degree Combinations

- Chemistry and Business Administration
- Life Sciences and Business Administration
- Life Sciences and Computer Science
- Life Sciences and Economics
- Mathematics / Applied Mathematics and Business Administration
- Mathematics / Applied Mathematics and Computer Science
- Mathematics / Applied Mathematics and Economics
- Physics and Materials Science and Engineering
- Physics and Mechanical Engineering
- Quantitative Finance and Business Administration
- Quantitative Finance and Economics
- Statistics and Business Administration

Admission Requirements for Polytechnic Diploma Holders

Local polytechnic applicants (regardless of nationality) will be considered for admission if their Diplomas are accredited to our Science, Pharmacy, Pharmaceutical Science or Environmental Studies courses.

Nanyang Polytechnic	NUS Major Courses
Biologics and Process Technology	Science (Chemistry)
Biomedical Engineering	Science (Physics)
Chemical and Green Technology	Environmental Studies Science (Chemistry)
Chemical and Pharmaceutical Technology	Science (Chemistry)
Digital and Precision Engineering	Science (Physics)
Electronics, Computer and Communication Engineering / Electronics, Computer and Control Engineering	Science (Physics)
Engineering with Business (For 2017 graduates onwards)	Science (Physics)

Nanyang Polytechnic

NUS Major Courses

Food Science and Nutrition *(Previously named as Food Science)*

Science (Chemistry)
Science (Food Science and Technology)
Science (Life Sciences)

Manufacturing Engineering

Science (Physics)

Mechatronics Engineering

Science (Physics)

Medicinal Chemistry

Science (Chemistry)
Science (Life Sciences)
Science (Pharmaceutical Science)
Science (Pharmacy)

Molecular Biotechnology

Science (Chemistry)
Science (Life Sciences)
Science (Pharmaceutical Science)
Science (Pharmacy)

Molecular Biotechnology

(Pharmaceutical and Clinical Trial track)

Science (Life Sciences)
Science (Pharmaceutical Science)
Science (Pharmacy)

Molecular Biotechnology

(R&D / Bioenterprise / Manufacturing track)

Science (Life Sciences)
Science (Pharmaceutical Science)
Science (Pharmacy)

Nanotechnology and Materials Science

Science (Chemistry)
Science (Physics)

Nursing (3-year programme)

Science (Life Sciences)

Pharmaceutical Sciences

Science (Chemistry)
Science (Life Sciences)
Science (Pharmaceutical Science)
Science (Pharmacy)

Ngee Ann Polytechnic

NUS Major Courses

Aerospace Technology / Aerospace Technology

(With minor in Business Management)

Science (Physics)

Biomedical Engineering / Biomedical Engineering

(With minor in Business Management)

Science (Computational Biology)
Science (Life Sciences)
Science (Physics)

Ngee Ann Polytechnic

NUS Major Courses

Biomedical Laboratory Technology / Biotechnology	Science (Chemistry) Science (Life Sciences) Science (Pharmaceutical Science) Science (Pharmacy)
Biomedical Science <i>(For 2015 graduates onwards)</i> • Specialisation: Clinical Laboratory Technology • Specialisation: Biomedical Research • Specialisation: Medicinal Chemistry (renamed)	Science (Chemistry) Science (Life Sciences) Science (Pharmaceutical Science) Science (Pharmacy)
Biomedical Science <i>(For 2014 graduates or earlier)</i> / Biomedical Science <i>(Medical Laboratory Technology option)</i>	Environmental Studies Science (Chemistry) Science (Life Sciences) Science (Pharmaceutical Science) Science (Pharmacy)
Chemical Engineering	Science (Chemistry)
Chemical and Biomolecular Engineering	Science (Chemistry)
Electrical Engineering / Electrical Engineering <i>(With minor in Business Management)</i>	Science (Physics)
Engineering Science	Science (Physics)
Environmental and Water Technology	Environmental Studies
Landscape Design and Horticulture <i>(Previously named as Horticulture and Landscape Management)</i>	Science (Life Sciences)
Molecular Biotechnology	Environmental Studies Science (Chemistry) Science (Life Sciences) Science (Pharmaceutical Science) Science (Pharmacy)
Optometry	Science (Life Sciences)
Pharmacy Science	Science (Chemistry) <i>[For 2013 graduates and earlier, and for 2017 graduates onwards]</i> Science (Life Sciences) Science (Pharmaceutical Science) Science (Pharmacy)
Veterinary Bioscience	Environmental Studies Science (Life Sciences)

Republic Polytechnic	NUS Major Courses
Aerospace Engineering	Science (Physics)
Biomedical Electronics	Science (Computational Biology)
Biomedical Science	Environmental Studies Science (Chemistry) <i>[For 2013 graduates and earlier]</i> Science (Life Sciences) Science (Pharmaceutical Science) Science (Pharmacy)
Biotechnology	Environmental Studies Science (Chemistry) <i>[For 2013 graduates and earlier]</i> Science (Life Sciences) Science (Pharmaceutical Science) Science (Pharmacy)
Environmental Sciences	Environmental Studies Science (Chemistry) Science (Life Sciences)
Marine Science and Aquaculture <i>(For 2017 graduates onwards)</i>	Environmental Studies Science (Life Sciences)
Materials Science	Science (Chemistry) Science (Physics)
Pharmaceutical Sciences	Environmental Studies Science (Chemistry) <i>[For 2013 graduates and earlier]</i> Science (Life Sciences) Science (Pharmaceutical Science) Science (Pharmacy)

Singapore Polytechnic	NUS Major Courses
Aeronautical Engineering	Science (Physics)
Applied Chemistry with Materials Science <i>(For 2017 graduates onwards)</i> <i>[Previously named as Materials Science]</i>	Science (Chemistry)
Applied Chemistry with Pharmaceutical Science <i>(Previously named as Chemical Process Technology)</i> <i>[Industrial Chemistry]</i>	Environmental Studies Science (Chemistry) Science (Pharmaceutical Science) Science (Pharmacy)

Singapore Polytechnic

NUS Major Courses

Biomedical Science	Science (Chemistry) Science (Life Sciences) Science (Pharmaceutical Science) Science (Pharmacy)
Biotechnology <i>(Medical Technology option)</i>	Science (Life Sciences) Science (Pharmaceutical Science) Science (Pharmacy)
Biotechnology	Environmental Studies Science (Chemistry) Science (Computational Biology) <i>[For 2017 graduates onwards]</i> Science (Life Sciences) Science (Pharmaceutical Science) Science (Pharmacy)
Chemical Engineering	Science (Chemistry) Science (Food Science and Technology) <i>[For 2017 graduates onwards]</i>
Environmental Management and Water Technology	Environmental Studies
Food Science and Technology <i>(Previously named as Chemical Process Technology [Food Technology])</i>	Science (Chemistry) Science (Food Science and Technology) Science (Pharmaceutical Science) Science (Pharmacy)
Materials Engineering	Science (Chemistry)
Materials Science <i>(Previously named as Chemical Process Technology [Polymer Option])</i>	Science (Chemistry)
Mechanical Engineering <i>(For 2017 graduates onwards)</i>	Science (Physics)
Medical Technology	Science (Life Sciences) Science (Pharmaceutical Science) Science (Pharmacy)
Nutrition, Health and Wellness	Science (Food Science and Technology) Science (Life Sciences)
Perfumery and Cosmetic Science <i>(Previously named as Chemical Process Technology [Industrial Chemistry])</i>	Science (Chemistry) Science (Pharmaceutical Science) Science (Pharmacy)
Process Engineering	Science (Chemistry)

Temasek Polytechnic

NUS Major Courses

Applied Food Science and Nutrition	Science (Chemistry) <i>[For 2017 graduates onwards]</i> Science (Food Science and Technology) Science (Pharmaceutical Science) Science (Pharmacy)
Biomedical Engineering <i>(For 2015 graduates onwards [Previously named as Biomedical Informatics and Engineering])</i>	Science (Computational Biology) Science (Life Sciences) Science (Physics)
Biomedical Informatics and Engineering	Science (Computational Biology) Science (Life Sciences)
Biomedical Science	Science (Chemistry) Science (Life Sciences) Science (Pharmaceutical Science) Science (Pharmacy)
Biotechnology	Science (Chemistry) Science (Computational Biology) <i>[For 2017 graduates onwards]</i> Science (Life Sciences) Science (Pharmaceutical Science) Science (Pharmacy)
Chemical Engineering	Science (Chemistry)
Mechatronics <i>(For 2017 graduates onwards)</i>	Science (Physics)
Pharmaceutical Science	Science (Chemistry) Science (Food Science and Technology) Science (Life Sciences) Science (Pharmaceutical Science) Science (Pharmacy)
Veterinary Technology	Science (Food Science and Technology) <i>[For 2017 graduates onwards]</i> Science (Life Sciences)

Advanced Placement Credits Advanced placement credits (APCs) are given to diploma holders of approved programmes from the five polytechnics in Singapore. Such students admitted to a four-year degree programme may be granted APCs in relevant modules for up to a maximum of 40 modular credits (MCs), as follows:

AUTO-GRANTED MCs (i) 20 MCs from Unrestricted Elective Modules

PERFORMANCE-BASED MCs (ii) Up to 20 MCs from programme requirements may be granted based on performance in advanced placement tests and / or interviews set by the department offering the module.

Computation of Admission Score for AY2018/2019

(1) Polytechnic results 80% (2) Singapore-Cambridge GCE 'O' Level results 20%

Please visit the Office of Admissions website for more details: www.nus.edu.sg/oam/apply/apply.html

- 1 Undergraduate Professional Internship Programme
- 2 Undergraduate Research Opportunities Programme in Science
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